# (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 24 December 2003 (24.12.2003)

**PCT** 

### (10) International Publication Number WO 2003/107041 A3

(51) International Patent Classification7: 23/00, G02B 3/00

C03C 21/00,

(21) International Application Number:

PCT/IL2003/000516

(22) International Filing Date:

17 June 2003 (17.06.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/388,752

17 June 2002 (17.06.2002)

(71) Applicant (for all designated States except US): BAR-ILAN UNIVERSITY [IL/IL]; ., 52 900 Ramat Gan (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ROSENBLUH, Michael [IL/IL]; Neve Tsuf, 71 945 D.N. Modi'in (IL). KAGANOVSKII, Yuri [IL/IL]; 30/11 Tsadi Gimmel Banot Street, 75 300 Rishon LeZion (IL).

(74) Agent: G. E. EHRLICH (1995) LTD.; 28 Bezalel Street, 52 521 Ramat Gan (IL).

(81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 11 March 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



(57) Abstract: A method of forming a microlens, comprising providing a doped glass having at least one metallic component other than copper, and locally irradiating the doped glass by a continuous wave laser beam, so as to melt a portion of the doped glass, thereby to form the microlens.



International application No.

PCT/IL03/00516

A. CLASSIFICATION OF SUBJECT MATTER  IPC(7): C03C 21/00, 23/00; G02B 3/00  US CL: 65/30.13, 102; 264/1.32, 1.37; 359/620  According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) U.S.: 65/30.13, 102; 264/1.32, 1.37; 359/620; 219/121.6, 121.61				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet				
C. DOCUMENTS CONSIDERED TO BE RELEVANT  Category * Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No.				
Category * Citation of	* Citation of document, with indication, where appropriate, of the relevant passages			
	US 5,768,022 A (LAWANDY) 16 June 1998 (16.06.1998), col. 3, line 57 to col. 8, line			
Y 9.				
Y JP 59-190240 abstract.	A (TOYOTA MOTOR CORP.) 29 O	ctober 1984 (29.10.1984), English	96-141, 174-221	
X US 6,218,774 B1 (POPE) 17 April 2001 (17.04.2001), figures 5 and 6 and col. 16, lines 26-47.			66-87	
		N <sub>e</sub>	,	
			1	
-				
	•			
		See nates femily on nov		
Further documents are listed in the continuation of Box C.		See patent family annex.  "T" later document published after the int	ametional Gling data on aniquity	
* Special categories of cited documents:		date and not in conflict with the appli	cation but cited to understand the	
"A" document defining the general state of the art which is not considered to be of particular relevance		principle or theory underlying the inv		
"E" earlier application or patent published on or after the international filing date			considered novel or cannot be considered to involve an inventive step	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)		"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination		
"O" document referring to an oral disclosure, use, exhibition or other means		being obvious to a person skilled in t	ne art	
"P" document published prior to the international filing date but later than the priority date claimed		"&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report 21 JAN 2004		
14 November 2003 (14.11.2003)  Name and mailing address of the ISA/US		Authorized officer		
Mail Stop PCT, Attn: ISA/US		Soon E Wincent		
Commissioner for Patents		Sean E Vincent  DEDORANTHOMAS  Telephone No. 703-308-0651  PARALEGAL STECHALIST		
P.O. Box 1450 Alexandria, Virginia 22313-1450  Racsimile No. (703)305-3230				

## BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Group I claim(s) 1-65, drawn to a method of making microlenses.

Group II, claim(s) 66-87, drawn to microlenses.

Group III, claim(s) 88-95, drawn to optical devices.

Group IV, claim(s) 96-221, drawn to methods of doping glass and making microlenses.

The inventions listed as Groups I, II, III and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the feature common to all four claim groups, i.e. non-copper doped glass microlens, is not novel because it is disclosed by US 5,604,635 A (Lowandy) in col. 6, lines 5-27 and 52-68. Therefore, there is no corresponding special technical feature of all four claim groups.

### Continuation of B. FIELDS SEARCHED Item 3:

IEEE Xplore

search terms: microlens, laser, iron, cerium, nickel, silver, gold